DOCUMENT RESUME

ED 021 647 PS 001 232

By- Horowitz, Frances Degen; Horowitz, Floyd R.

HEAD START EVALUATION AND RESEARCH CENTER, UNIVERSITY OF KANSAS. REPORT NO. XI. VERBAL RECALL RESEARCH.

Kansas Univ., Lawrence. Dept. of Human Development.

Spons Agency- Institute for Educational Development, New York, N.Y.; Office of Economic Opportunity, Washington, D.C.

Pub Date 30 Nov 67

Note- 19p.

EDRS Price MF-$0.25 HC-$0.84

Descriptors- *CULTURALLY DISADVANTAGED, LANGUAGE ABILITY, *LANGUAGE DEVELOPMENT, *LANGUAGE LEARNING LEVELS, LANGUAGE PATTERNS, LANGUAGE RESEARCH, LANGUAGE SKILLS, LANGUAGE TYPOLOGY, LEARNING PROCESSES, MIDDLE CLASS, PHONEMES, *PRESCHOOL CHILDREN, RECALL (PSYCHOLOGICAL), RETENTION, *RETENTION STUDIES

Identifiers- *Head Start, Jenkins And Palermo Normative Word Lists

Approximately 60 3-, 4-, and 5-year-old children were administered a language test constructed to determine theirlanguage usage levels and limitations. Half of the children were classified as Head Start and half as middle class. The language test involved the presentation of strings of three to seven phonemes organized on five levels of intelligibility: (1) nonsense words, (2) nonsense words with a verb in the middle of the string, (3) recognizable words in nongrammatical form, (4) simple sentences, and (5) transform sentences; that is, sentences in intelligible form but which necessitate transformation of a word or two to be gramatically correct, which the child was then asked to repeat back to the experimenter. The data from this study has not yet been completely analyzed, but some trends have appeared. The five types of word formations appear to represent a hierarchy, related, in terms of the child's ability to recall them, to age. That is, the older the child, the more complete is his recall of words in higher order word formations. For strings of nonsense words, however, the 5-year-olds did not do any better than the 3- and 4-year-olds. It appears that the language ability of the Head Start child on the experimental task is about one year behind that of the middle class child. (WD)

U. S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
OFFICE OF EDUCATION

THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL OFFICE OF EDUCATION POSITION OR POLICY.

The University of Kansas Head Start Evaluation and Research Center

XI.

"Verbal Recall Research"

Frances Degen Horowitz, Ph.D

Floyd R. Horowitz, Ph.D.

Department of Human Development

Department of English

PS001232

ED021647

A STUDY OF RECALL AND ACQUISITION OF LANGUAGE FORMS IN YOUNG CHILDREN[1]

Horowitz, Floyd R., Horowitz, Frances Degen
&
Silverman, Saundra

It is well known that language competence is broadly related to a variety of behaviors generally classified as intellectual. Further, in the variety of sub-cultures present in the United States, there are correlate language systems which to a range of degrees do not facilitate performance in "standard" language settings. With specific reference to the Head Start population it is not clear whether measured language deficits reflect slow acquisition in normal development or the interference of dialect with standard English or both. There are three main concerns proper to the generalized study of acquisition of natural language forms in children. Very little is known about the first--what are the neurophysiological mechanisms that make spoken language possible? In this regard we would wish to know what ontogenetic capacity the child is endowed with, and to what extent that capacity may be shaped by phylogenetic events. As well, it would be useful to differentiate neurophysiologically developmental stages in the child's perception, retention, and generation of language forms. The second main concern is involved with interpolating this as yet uncharted internal complex--according to what continuous system of classifiable logic does the child produce meaningful language forms? In evidence, of course, are his many utterances, from babbling to a one or two word vocabulary by the end of the first year, two or three word juxtapositions and a vocabulary of about two hundred words by the end of the second year, three, four, and five word strings interlacing relatively many language forms by the end of the third year. The ongoing record of such a process, including a description of the child's limitations at any stage, constitutes the third main concern in the study of acquisition of natural language forms.

The controlled research design to be described here relates mainly to this last concern, being in effect a normative and comparative description of childrens' performance over an arbitrarily defined series of verbal language tasks. A pilot study for this present design was done at the University of Minnesota Institute for Child Research and replicated at the University of Kansas Preschool, in each site employing twenty-four children between the ages of 3 years 0 months and 5 years 11 months. At that time it was determined that there was no difference in correct performance length when a child was asked to repeat a string of numbers between one and ten, and when he was asked to repeat a comparably long string of words known to him, put in ungrammatical order. However, children from middle income backgrounds and children from low income backgrounds were differentiated in performance, with children from the low income environments doing more poorly.

Regarding the use of the term "acquisition" there is some discussion in the literature about what valid differences of definition may exist between a child's ability to recall a verbal task when asked to do so, and the related inference that when he can successfully recall a task involving a given form he has in fact acquired that form as part of his language repertory. We have considered this as a moot question, for while it seems to be true that recall and acquisition are somewhat ambivalently defined when the child can successfully repeat a short

length string--that is, one or two phonemes long--it is plainly seen that in general he does not have the same success with all strings of the same length. It might therefore be possible to defend the assumption that acquisition is in effect a coding which facilitates the child's recognition of language forms as well as his capacity to reproduce those forms. As will be seen in the developmental arrangement of the data, there is a clear normative difference between the stage at which children can remember tasks of complexities equally well, and the stage at which only certain forms are correctly recalled.

The present study followed the pilot work in modifying and extending the stimuli to test more specifically relative difficulty of certain linguistic forms in both populations.

METHOD

Stimuli

We desired to test whether there were any differences in childrens' ability to repeat five kinds of verbal tasks that we had prejudged as hierarchic in a system of implicit forms. Strings in length from three to seven phonomes were constructed for each kind of task (Figure 1). It was supposed for A_1 strings that the nonsense words would reveal no especial form in their juxtaposition and that the child would perform most poorly in recall of progressively longer strings. It was supposed for A_2 strings that the introduction of a verb into a nonsense string would provide a minimal degree of structuring insofar as the child might have learned that the word before or after such a recognizable word is to be retained with it. It was supposed for B and for C strings that when the child could recognize all the words as ones which he knew, even though they had been juxtaposed to avoid grammatical form as the adult knows it, this might constitute a language form, if only by contrast to the form-less sequence of nonsense words, and if only when he had to recall a short string. It was supposed for D strings that simple sentences constituted the next highest order of forms in our hierarchy, though it would have been possible to construct a form between B/C and D strings. It was supposed that some form of transform sentences should be represented by E strings, and that in order to recognize and repeat correctly such a form the child would have to recognize in some way the prior and more extensive form of the transform. Thus, for instance, in the sentence "John fell who fast rode his horse." the child might understand that John was the one who fell when he rode his horse very fast, and might repeat the sentence, as some did, "John fell who rode his orse fast." While on the one hand we were not concerned to write transform rules for the supposed hierarchy of these five kinds of task, on the other hand we assumed that the performance data would reveal if the hierarchy merely was specious. And to avoid juxtaposing words with strong paired associate proclivity of relationship for young children, the Jenkins & Palermo normative word lists of paired associate strength were consulted.

SUBJECTS

Our design called for sixty subjects paired according to sex and selected by the following criteria. Thirty were from middle income homes,

the other thirty--classified as Headstart children--from low income homes . . Since various claims had been made about the nature and difference of standard language performance between Headstart children and so-called normal children, we thought that among other results these tests might provide a valid measure of comparison. Each group of thirty was further divided into three groups of ten, according to age. In the first subgroup were children from 3 years 0 months to 3 years 4 months; in the second group were children from 4 years 0 months to 4 years 4 months; in the third group were children from 5 years 0 months to 5 years 4 months.

PROCEDURE

The test situation for each child lasted approximately seven minutes. A research assistant was seated opposite the child, explained the tasks as a game in which the child was to listen to the words that the assistant said and then on kinesic cue was to say what the assistant had said. The experimenter also introduced the tape recorder to the child. In the pilot study the child was told he could have a small toy if he played through the entire game, and this technique was especially helpful in keeping the interest of the 3-year-old activists. In the present study, however, we have eschewed this reward, hoping to use it more effectively in subsequent conditioning procedures. Performance of 3-year-olds accordingly was not as consistant as had been the case in the pilot study.

The research assistant tested the subject's ability to understand and perform through a warm-up session over one and two phoneme lengths, given all the kinds of tasks possible through those lengths. Children were disqualified who failed to complete correctly the warm-up, who made no other responses after the warm-up, who exhibited a speech defect, or who were not native speakers of English. Test strings were presented to the children in order of increasing string length. While random order at first had seemed preferable, it was discovered in the pilot study that the younger children were easily discouraged by immediate presentation of the longest strings. Each subject's responses were tape recorded and verified by two listeners, having to qualify at .7 or above. There was better than .9 agreement for many of the 4-year-olds and most of the 5-year-olds. As complete a written record as possible was kept of the child's response utterances and all sessions were tape recorded.

RESULTS AND DISCUSSION

To date, only a general description of the results is available. Data is still being collected from low income three year olds Ss. All data is to be key punched for further computer analysis. Some forms of the response data are given in Figures 1-12. Figures 1-6 indicate total number of words correctly recalled for each kind of stimulus string regardless of position, over each of the lengths from three to seven. Figures 7-12 indicate total number of complete stimuli strings correctly recalled in the order of presentation of their elements, over each of the lengths from three to seven. Because of the nature of the distribution, the data met none of the general assumptions necessary to analysis of variance. Chi square measures also were not applicable because generally the N values were too small to reveal significance. However, both

limitations point up what in effect is a strength of the design, that the resultant data reflect the interaction of the five kinds of stimuli tasks and childrens' age with very little variation. Results of the pilot study over an additional forty-eight subjects support this observation.

Insert figures 1-12 here

It can be seen, following the frames of each set, that correct recall of the kinds of stimuli strings generally was a function of increase in age. Most simply expressed, up to a point (for example Figure 12), the 5-year-old remembers more longer and complete language forms than does the 4-year-old, though once past the five phoneme length his performance drops so sharply as to be not much superior to the 3-year-old. Respectively, this trend also characterises the difference in performance between the 4-year-old and the 3-year-old. Consulting Figure 6 it can be seen that while the 5-year-old's acquisition of a seven phoneme complex language form as yet may be inadequate, he correctly can recall approximately 60% of the elements in such a structured string, while in a random word string of like length, (Figure 3), he correctly recalls only 30% of the elements. A related findings is expressed in Figure 1 & 2 where the 5- year- old does not perform as adequately as the 4-year-old or the 3-year-old in recalling a nonsense string. Tentatively this might be explained to record, retain, and generate language information on the basis of certain and not other modes of encoding.

The direction of that acquisition which is shown most clearly in Figure 12 is toward what has been called transform concepts of language forms, that is forms which imply the child's comprehension of related prior forms. If the child does not recognize the stimulus string as having a certain form, (see Figure 10) his recall performance will be lower than if he does recognize such, or part of such a form (see Figure 12). To promote this inference we constructed the C and E strings as permutations of each other. The most dramatic indication of this process is found by comparing Figure 3 with Figure 4, and Figure 9 with Figure 11 where B and D strings were permutations of each other.

Considering a comparison between the Headstart and the middle income children, these same developmental trends are in evidence, though performance level according to age differs markedly. The 5-year-old Headstart child generally performs like the 4-year-old middle income child, and the 4-year-old Headstart child like the 3-year-old middle income child. Performance of the 3-year-old Headstart cell has not yet been recorded, though we quite naturally will be interested in pursuing the analogy. Also it should be noted, Figures 5 and 11, that as the string length increases for the more complex language forms. 5-year-old Headstart performance drops below the 4-year-old middle income level as well. Because the Headstart childrens' performances in these tasks are not different in order of development from those of the other group, but perhaps only different in rate, we are tempted to think of normative acquisition of language forms for both groups as being shaped and promulgated in the same way--namely by environmental conditioning.

However, this common-sense assumption needs to be explored, and some of its implications tested. For instance, it recommends as possible that the recognition and generation of language forms in the young child

greatly can be effected by strengths and kinds of conditioning, and that while certain tendencies of transform construction normatively may be recorded, these tendencies can be altered by other forms of conditioning. Such activity of acquisition, while naturally confined by neurophysiological boundaries, then might be described. Especially now when without evidence and for reasons of logic grammarians have begun to claim that their kernel transforms are nothing less than ontogenetically derived universal forms, there is need for a more qualified appraisal of what variables of experience can effect and do effect the developmental process of language acquisition.

Our further analysis of the present data should yield some interesting information about the nature of the errors that were made. Our further research will proceed to conditioning paradigms and their relationships in language acquisition.

O FSU01232 O

FOOTNOTES

1. The research reported herein was performed pursuant to a contract with the Office of Economic Opportunity, Executive Office of the President, Washington, D.C., 20506. The opinions expressed herein are those of the author and should not be construed as representing the opinion or policy of any agency of the United States Government.

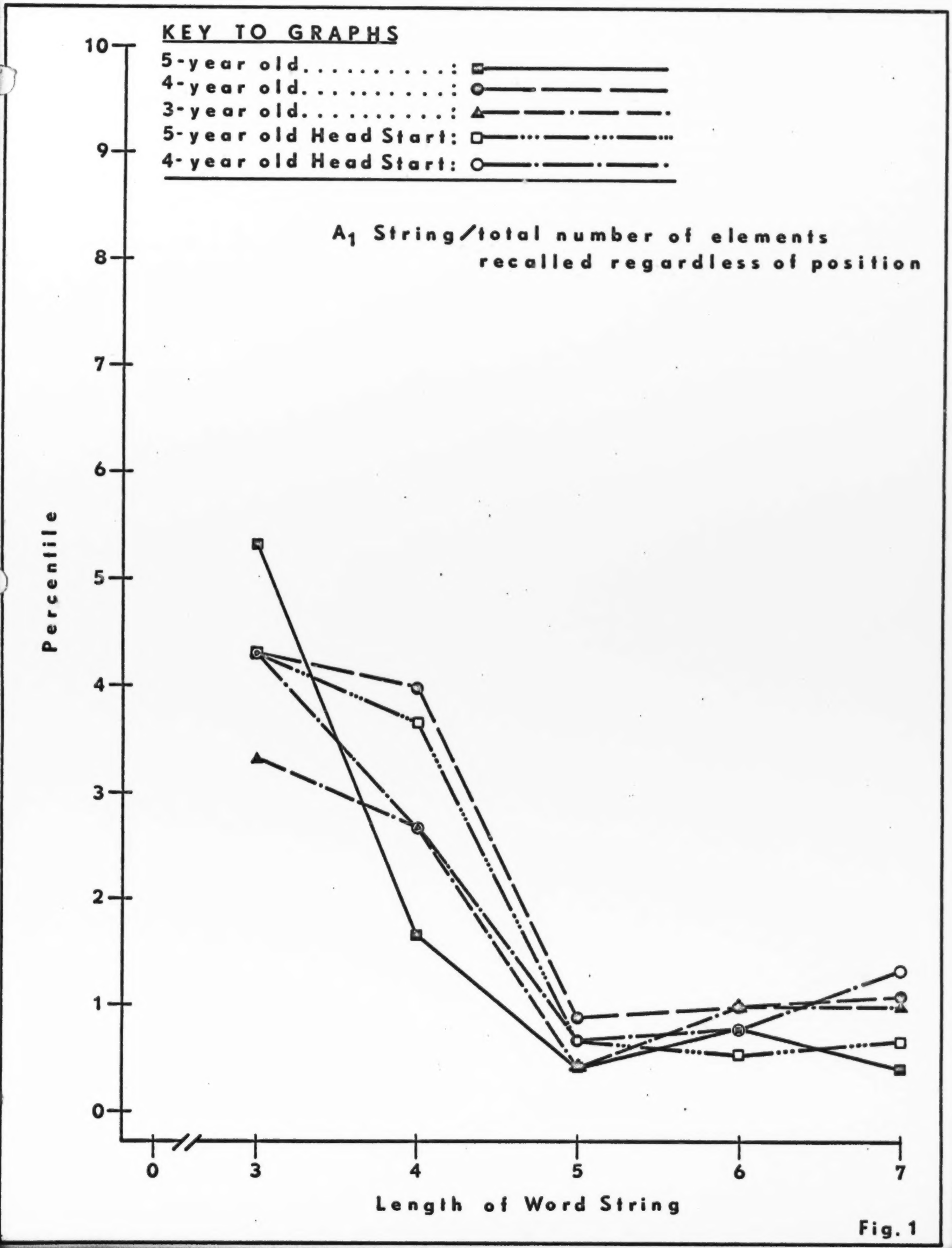
KEY TO GRAPHS
5-year old.....:
4-year old.....:
3-year old.....:
5-year old Head Start:
4-year old Head Start:
A_1 String/total number of elements recalled regardless of position
Percentile
10
9
8
7
6
5
4
3
2
1
0
0
3
4
5
6
7
Length of Word String

Fig. 1

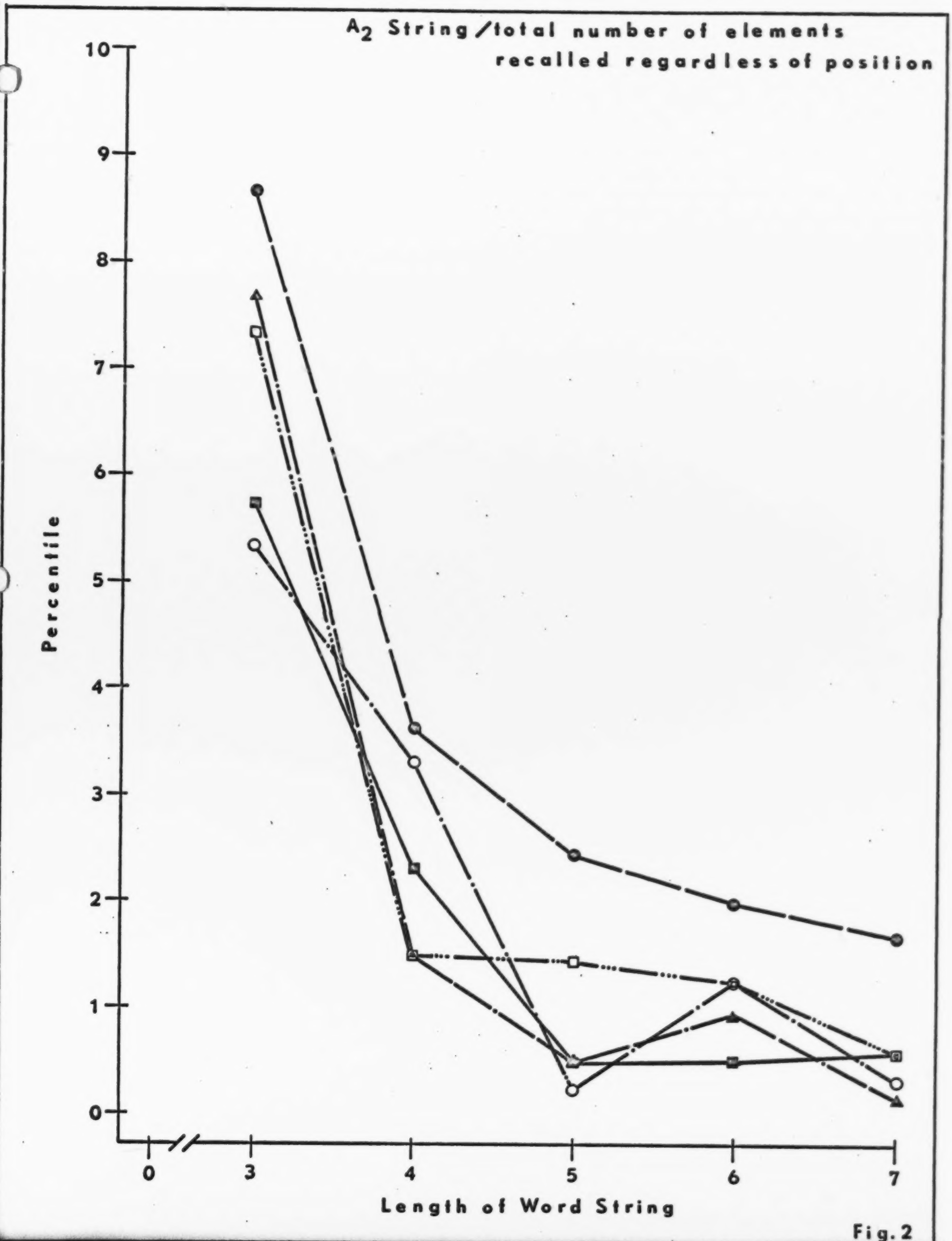
A2 String / total number of elements recalled regardless of position
Percentile
10
9
8
7
6
5
4
3
2
1
0
0
3
4
5
6
7
Length of Word String

Fig. 2

B String /total number of elements recalled regardless of position

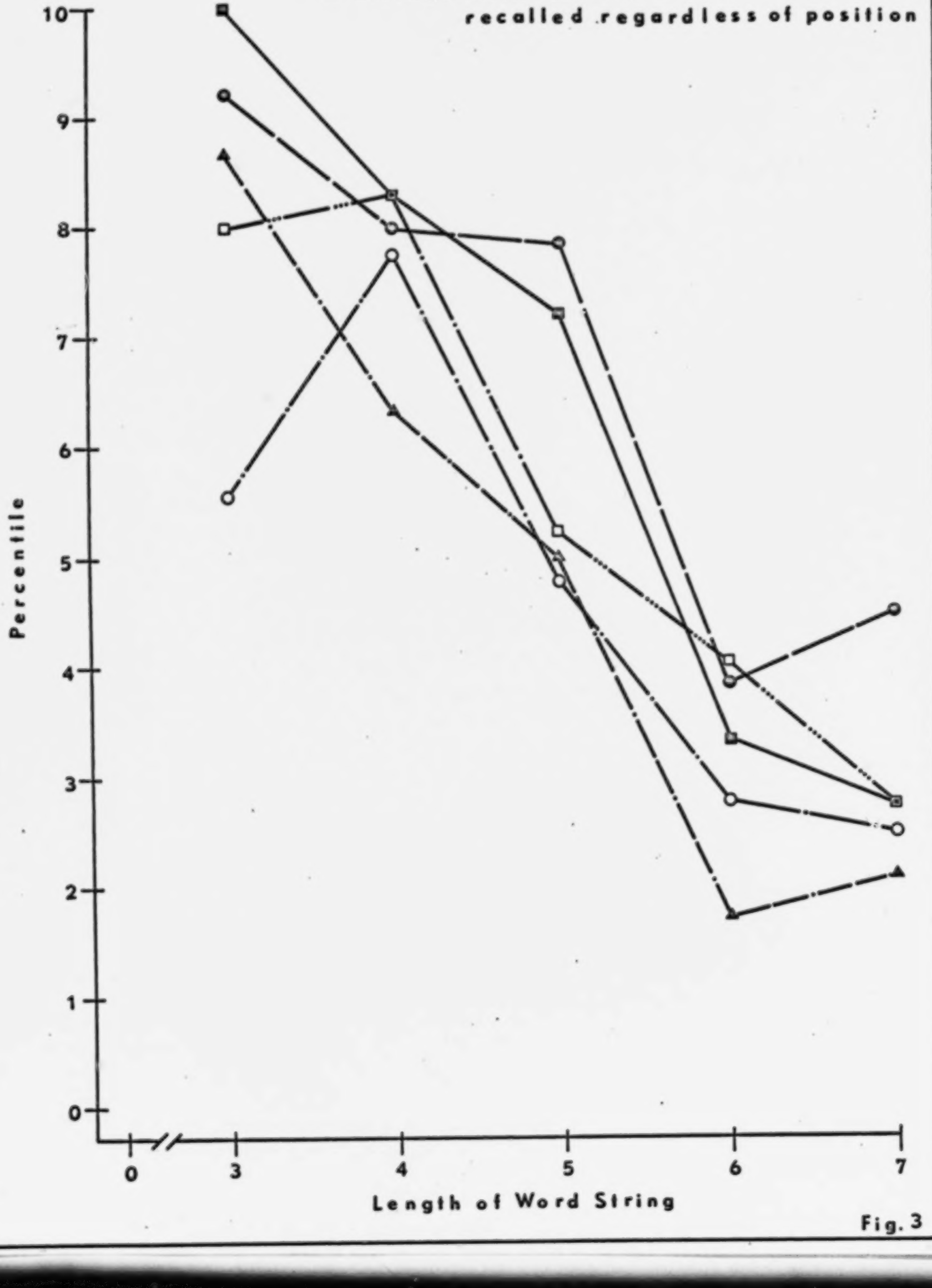

Fig. 3

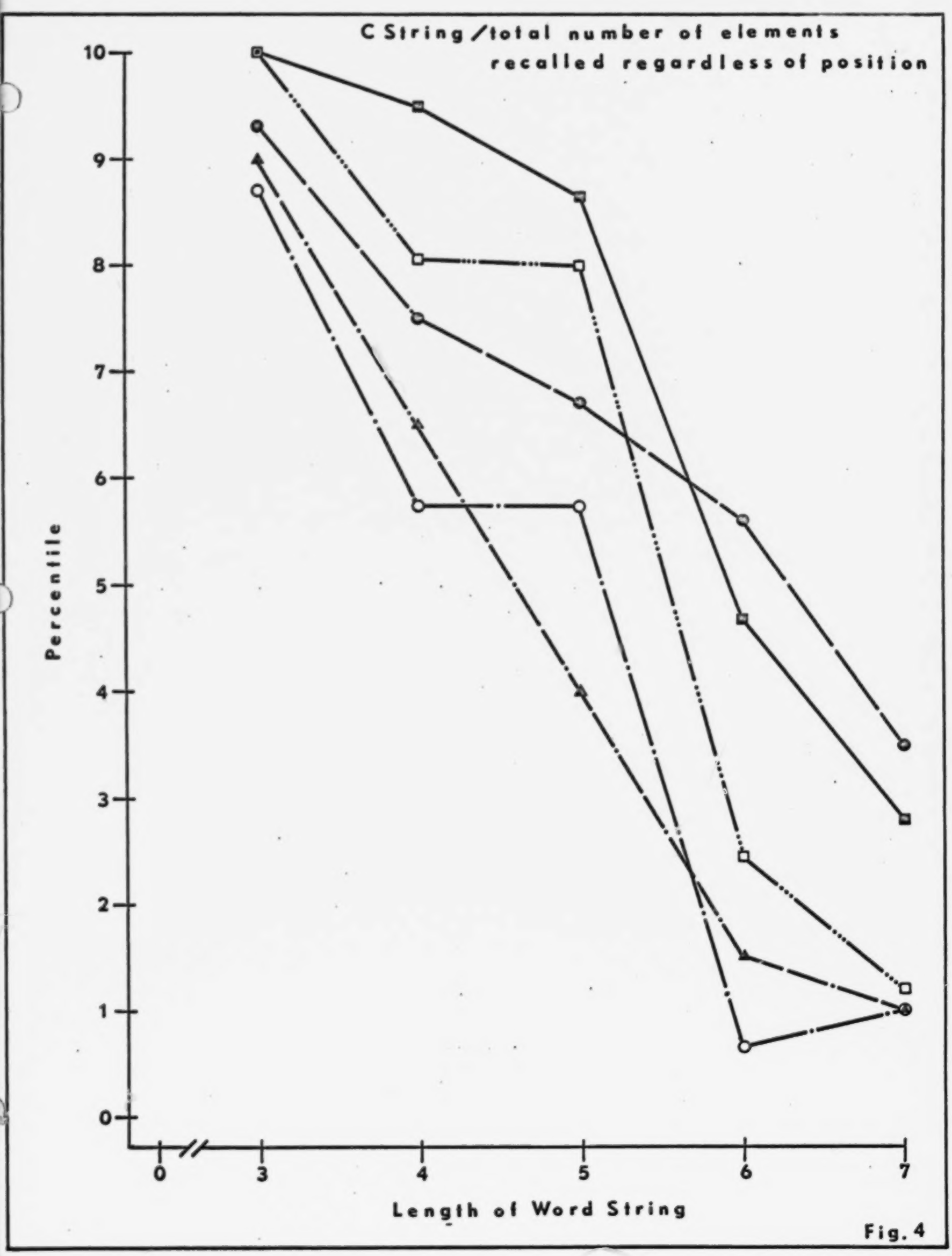
C String / total number of elements recalled regardless of position
Percentile
10
9
8
7
6
5
4
3
2
1
0
0
3
4
5
6
7
Length of Word String

Fig. 4

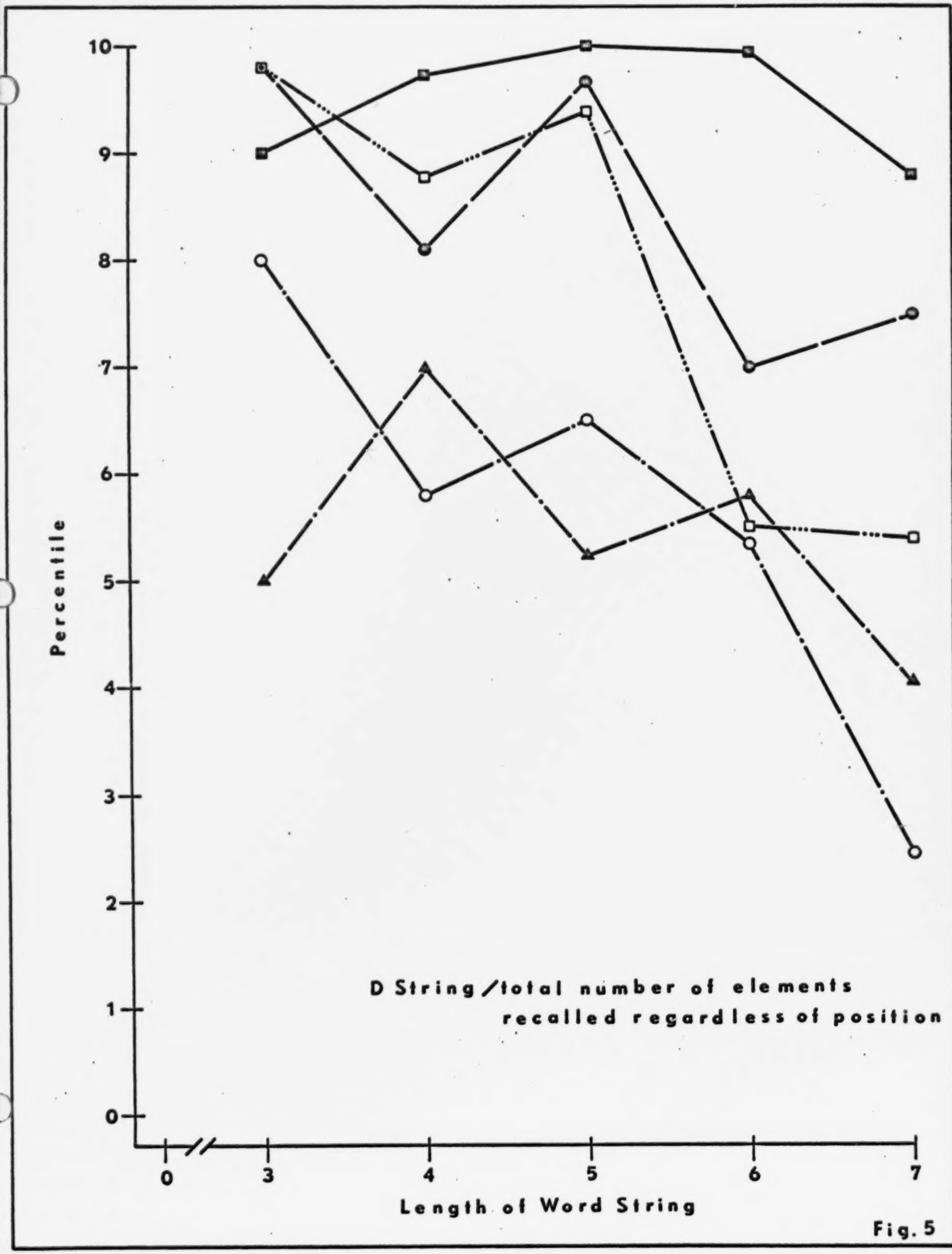
10
9
8
7
6
5
4
3
2
1
0
Percentile
0
3
4
5
6
7
Length of Word String
D String / total number of elements
recalled regardless of position

Fig. 5

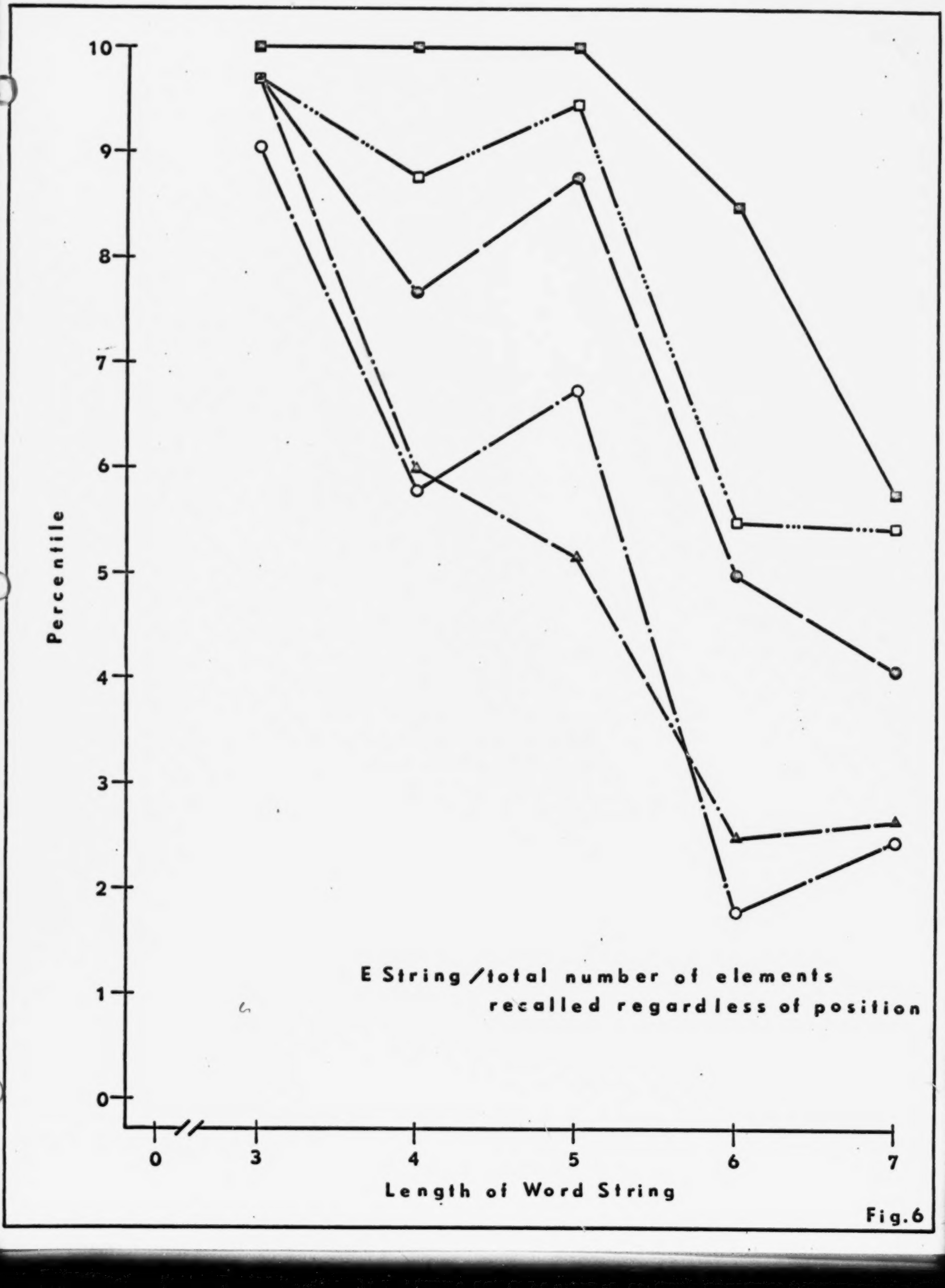
10
9
8
7
6
5
4
3
2
1
0
Percentile
0
3
4
5
6
7
Length of Word String
E String / total number of elements
recalled regardless of position

Fig.6

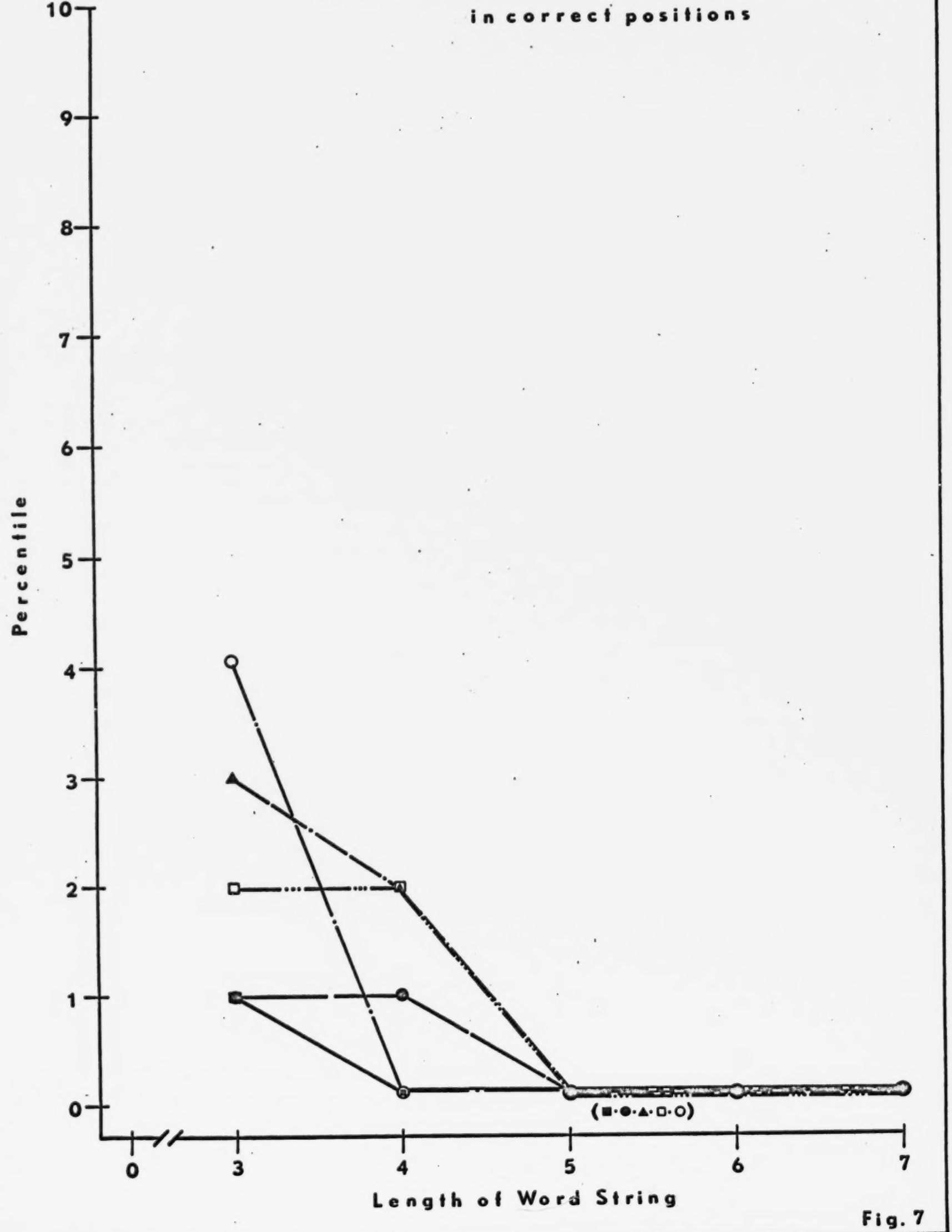
A1 String/complete recall of all elements in correct positions
Percentile
10
9
8
7
6
5
4
3
2
1
0
(■·●·▲·□·○)
0
3
4
5
6
7
Length of Word String

Fig. 7

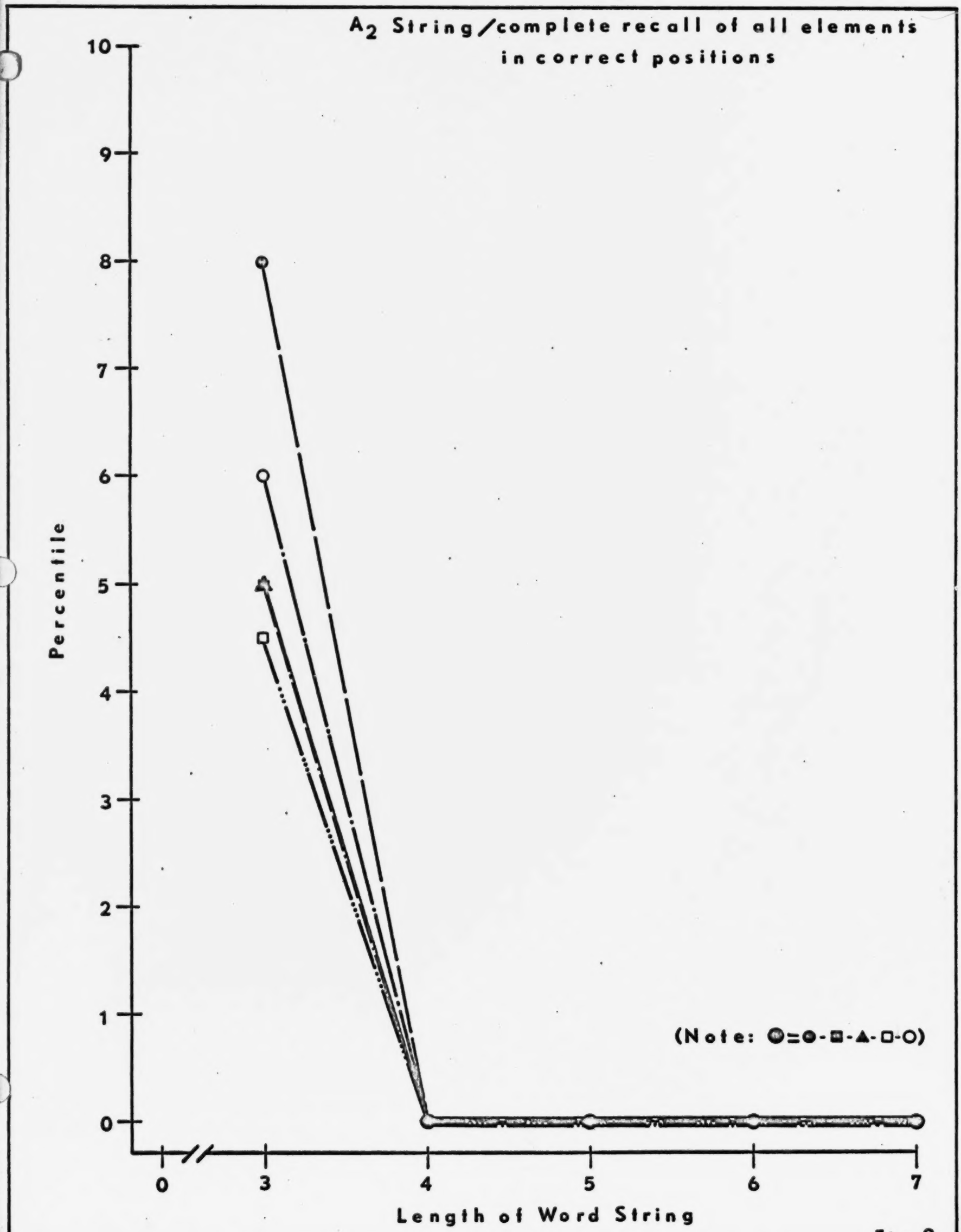
A_2 String/complete recall of all elements in correct positions
Percentile
10
9
8
7
6
5
4
3
2
1
0
0
3
4
5
6
7
Length of Word String
(Note: ●=●-■-▲-□-○)

Fig. 8

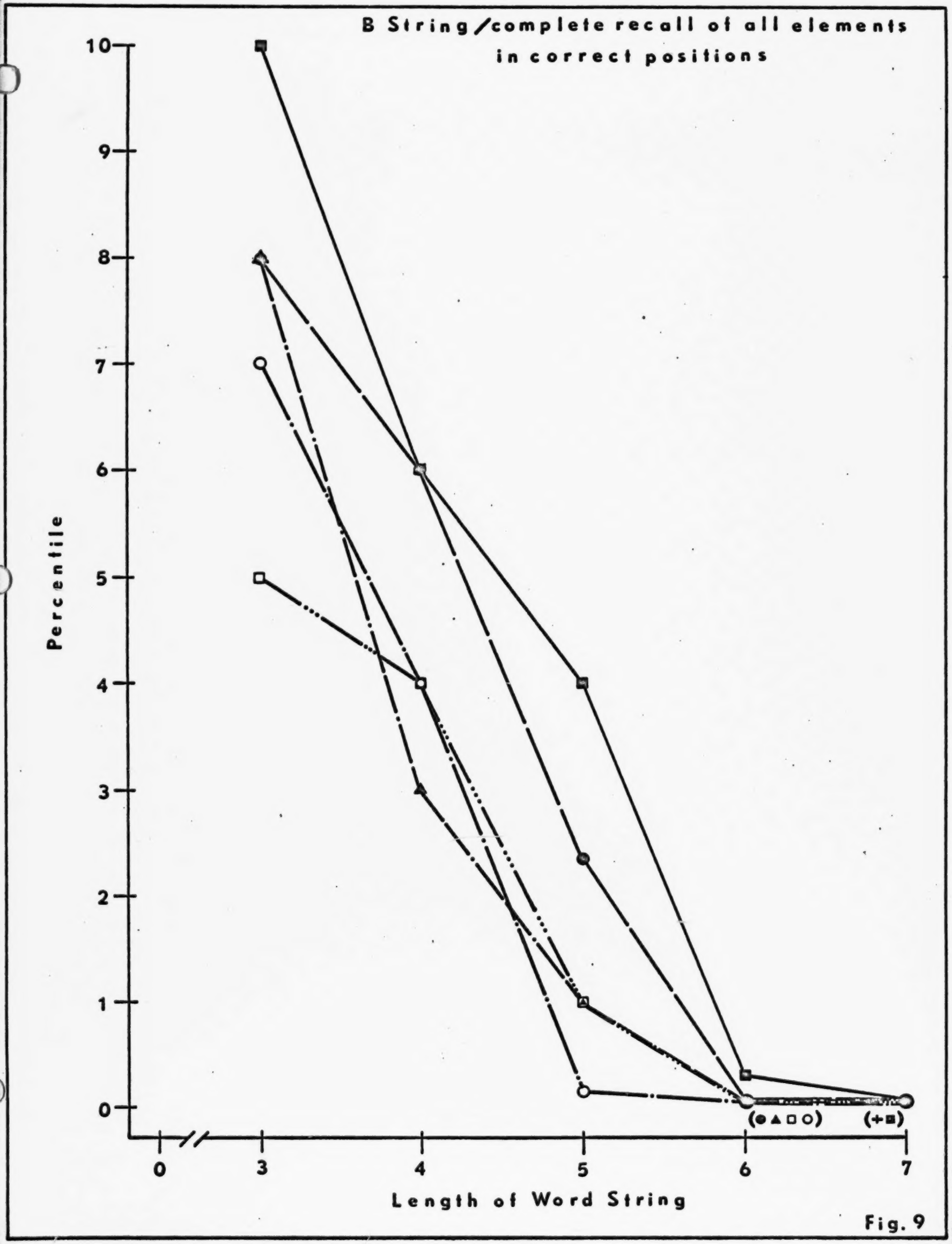
B String / complete recall of all elements in correct positions
Percentile
10
9
8
7
6
5
4
3
2
1
0
(●▲□○)
(+■)
0
3
4
5
6
7
Length of Word String

Fig. 9

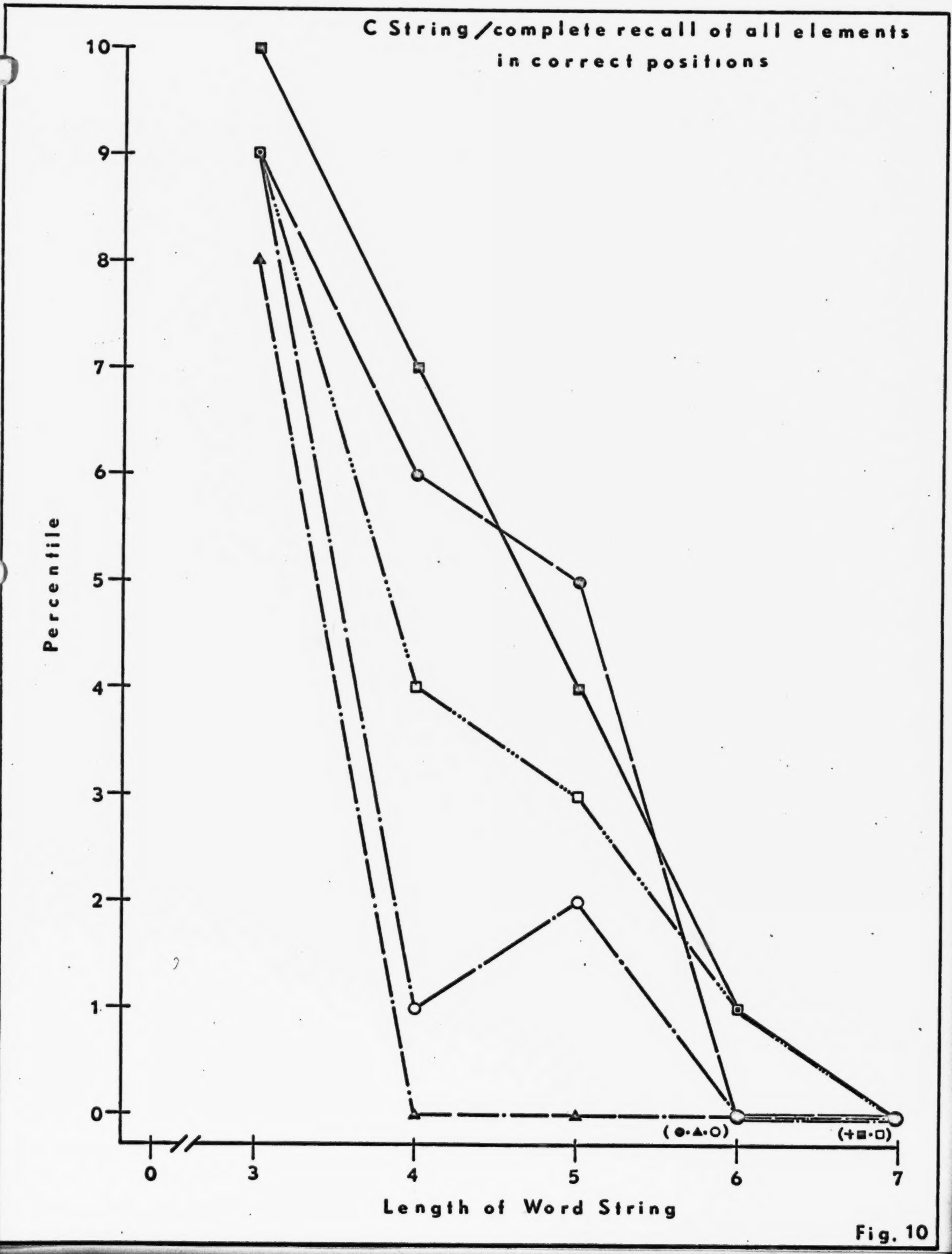
C String / complete recall of all elements in correct positions
Percentile
10
9
8
7
6
5
4
3
2
1
0
0
3
4
5
6
7
Length of Word String
(●·▲·○)
(+■·□)

Fig. 10

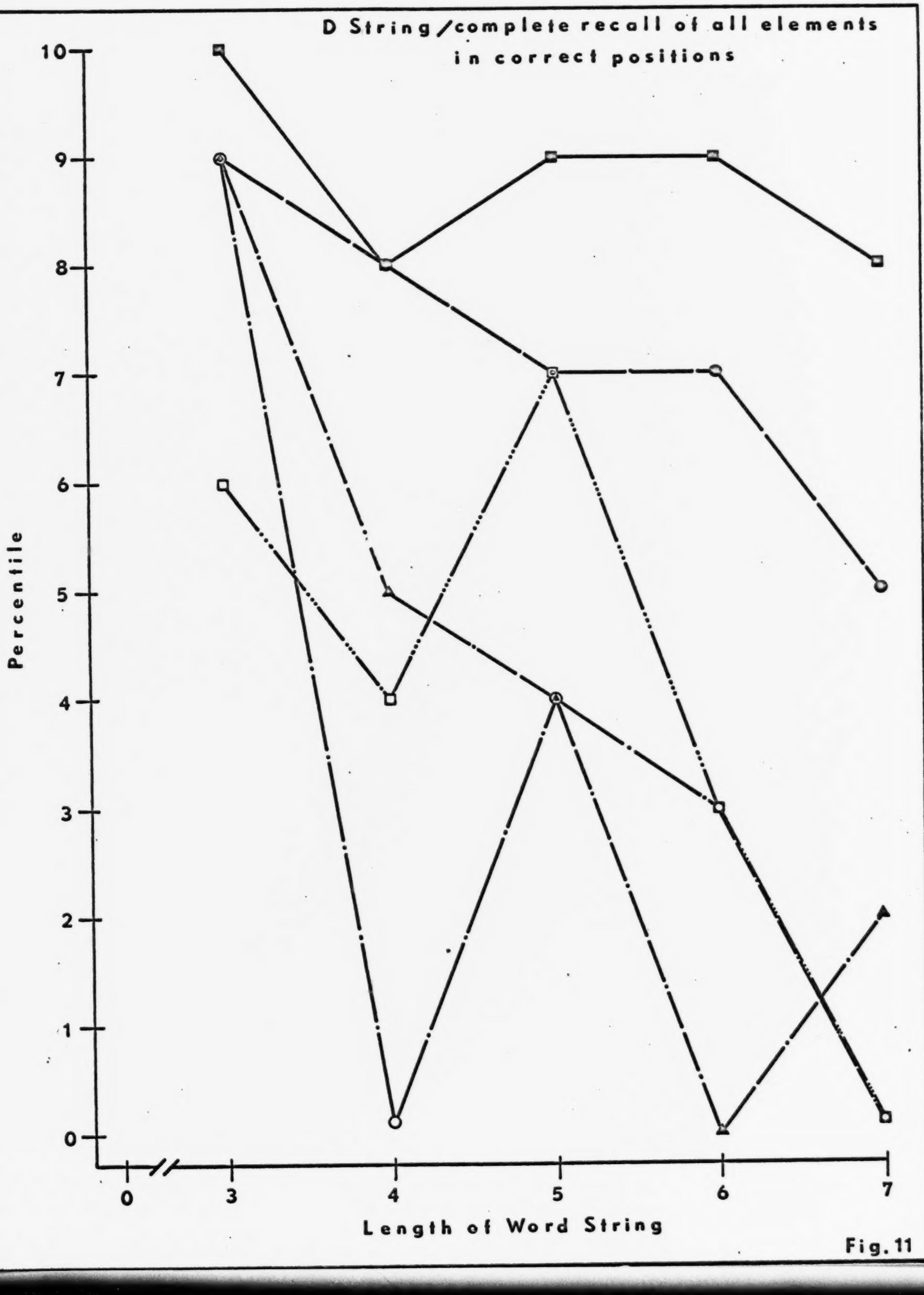
D String / complete recall of all elements in correct positions
Percentile
10
9
8
7
6
5
4
3
2
1
0
0
3
4
5
6
7
Length of Word String

Fig. 11

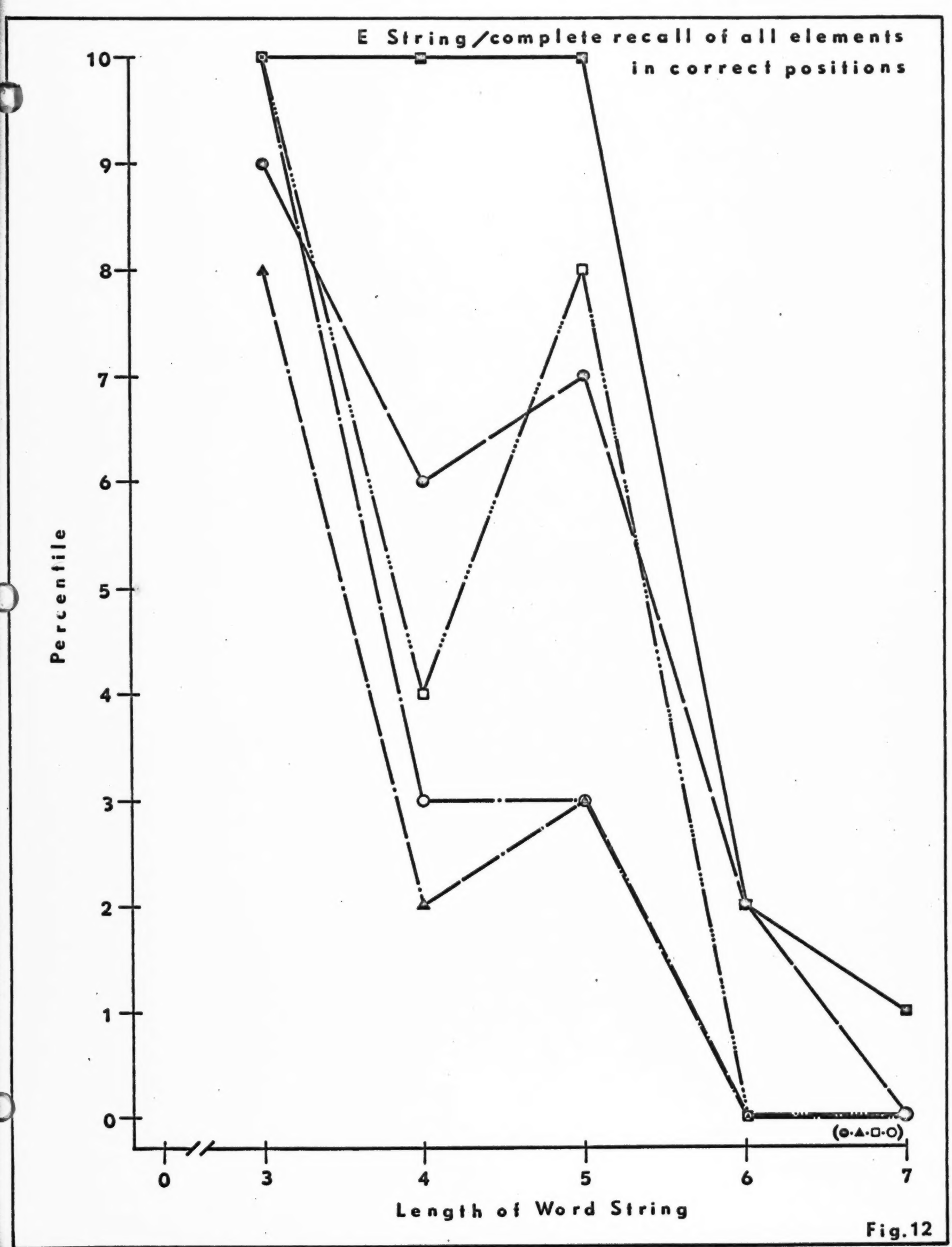
E String/complete recall of all elements in correct positions
10
9
8
7
6
5
4
3
2
1
0
Percentile
0
3
4
5
6
7
Length of Word String
(●·▲·□·○)

Fig.12